

Claims

1. Method for releasing slug (9, 15, 25) adhering to a stamp (2, 24) in a punching machine (1, 12, 17, 22), by carrying the stamp (2, 24), after performing a punching operation on a sheet material (4), with the active stroke at least partially through a cutting opening (6) in a cutting plate (3, 13, 21) supporting the sheet material (4), and carrying the stamp (2, 24) during the return stroke back again through the cutting opening (6) in the cutting plate (3, 13, 21) which close-fittingly encloses the stamp (2, 24),
characterized in that the cutting opening (6) functions during the return stroke such that the side (14) of the cutting plate (3, 13, 21) remote from the sheet material (4) engages around the cutting opening (6) as a scraping edge (11) on slug (9, 15, 25) adhering to the stamp (2, 24) and releases it from the stamp (2, 24).
2. Method as claimed in claim 1, characterized in that the stamp (2, 24) is carried through the cutting opening (6) in the cutting plate (3, 13, 21) during the punching operation such that the periphery of the slug (9, 15, 25) adhering to the stamp (2, 24) is released over only a part of the periphery from the cutting plate (3, 13, 21).
3. Method as claimed in claim 1, characterized in that the stamp (2, 24) is carried through the cutting opening (6) in the cutting plate (3, 13, 21) during the punching operation such that the periphery of the slug (9, 15, 25) adhering to the stamp (2, 24) is wholly released from the cutting plate (3, 13, 21).
4. Method as claimed in any of the foregoing claims, characterized in that the return stroke of the stamp (2, 24) is continued so far that the cutting opening (6) in the cutting plate (3, 13, 21) and the sheet material (4) are left clear by the stamp (2, 24).
5. Method as claimed in claim 4, characterized in that after the sheet material (4) has been left clear by the stamp (2, 24), the processed sheet material (4) is removed from the cutting plate (3, 13, 21).
6. Method as claimed in any of the foregoing claims, characterized in that a sheet

material (4) for processing is placed on the cutting plate (3, 13, 21) before commencing the punching operation.

7. Method as claimed in any of the foregoing claims, **characterized in that** slug
5 (9, 15, 25) released from the stamp (2, 24) is discharged.

8. Punching machine (1, 12, 17, 22) for releasing slug (9, 15, 25) adhering to a stamp (2, 24), comprising:
- a cutting plate (3, 13, 21) provided with at least one cutting opening (6),
10 - at least one stamp (2, 24) for linear intermittent displacement which is displaceable between a position in which the cutting opening (6) in the cutting plate (3, 13, 21) is left clear by the stamp (2, 24) and a position in which the stamp (2, 24) is carried through the cutting opening (6),
characterized in that the stamp (2, 24) passes close-fittingly through the cutting
15 opening (6) of the cutting plate (3, 13, 21).

9. Punching machine (1, 12, 17, 22) as claimed in claim 8, **characterized in that** the free space between the stamp (2, 24) and the associated cutting plate (3, 13, 21) in the position where the stamp (2, 24) is carried through the cutting opening (6) is smaller
20 than 0.02 mm.

10. Punching machine (1, 12, 17, 22) as claimed in claim 8 or 9, **characterized in that** the cutting plate (3, 13, 21) is adapted to support a material layer for processing, and the edge (11) of the cutting opening (6) on the side (14) remote from the side
25 supporting the material layer is sharp.

11. Punching machine (1, 12, 17, 22) as claimed in any of the claims 8-10, **characterized in that** the edge (11) of the cutting opening (6) on the side (14) remote from the side supporting the material layer at least locally encloses an angle with a
30 cutting edge of the stamp (2, 24).

12. Punching machine (1, 12, 17, 22) as claimed in any of the claims 8-11, **characterized in that** the cutting plate (3, 13, 21) is supported by a punch plate (7, 18, 23) with a passage (8, 20, 26) for slug (9, 15, 25) connecting onto the cutting opening

(6) in the cutting plate (3, 13, 21), which passage (8, 20, 26) is larger than the cutting opening (6).

13. Punching machine (1, 12, 17, 22) as claimed in claim 12, **characterized in that**
5 the punch plate (7, 18, 23) supports a plurality of separate cutting plates.

14. Punching machine (1, 12, 17, 22) as claimed in claim 12 or 13, **characterized in that** the cutting plate (3, 13, 21) is connected releasably to the punch plate (7, 18, 23).

10 15. Punching machine (1, 12, 17, 22) as claimed in any of the claims 8-14, **characterized in that** suction means connect onto the cutting opening (6) for discharge of slug (9, 15, 25) .

16. Punching machine (1, 12, 17, 22) as claimed in any of the claims 8-15,
15 **characterized in that** blowing means connect onto the cutting opening (6) for discharge of slug (9, 15, 25) .

17. Punching machine (1, 12, 17, 22) as claimed in any of the claims 8-16,
characterized in that the punching machine (1, 12, 17, 22) comprises drive means for
20 the linear intermittent displacement of the stamp (2, 24).